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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/618,709	07/15/2003	Jun Funakoshi	108066-00090	4930

4372 7590 06/18/2007

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EXAMINER	
YODER III, CHRISS S	

ART UNIT	PAPER NUMBER
2622	

MAIL DATE	DELIVERY MODE
06/18/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/618,709	FUNAKOSHI ET AL.	
	Examiner	Art Unit	
	Chriss S. Yoder, III	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03/20/2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to claims 1, 5, and 7 have been considered but are moot in view of the new ground(s) of rejection. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims **1-8** are rejected under 35 U.S.C. 103(a) as being unpatentable over Krymski et al. (US Patent # 6,809,766).

2. In regard to **claim 1**, note Krymski discloses an image sensor for capturing images, comprising a pixel array where pixels having photoelectric conversion elements are arranged in a matrix (column 2, lines 5-13 and figure 1: 100), a plurality of row select lines which are arranged in a row direction in said pixel array (column 3, lines 14-20 and figure 1: Row Sel), a plurality of column lines which are arranged in a column direction in said pixel array (column 3, lines 14-20 and figure 1: Col Bus), a vertical scan circuit for generating vertical scan signals to sequentially select said plurality of row select lines (column 4, lines 44-48), and wherein said vertical scan circuit sequentially selects and scans said plurality of row select lines within a first vertical scan period

when said image sensor is controlled to a first frame period and also sequentially selects and scans said plurality of row select lines within said first vertical scan period even when said image sensor is controlled to a second frame period, which is longer than said first frame period (column 4, lines 1-34, the first frame period is considered to be the image captured using the integration/shutter width of 3, and the second frame period is considered to be the image captured using the integration/shutter width of 14; and considering the read period of each frame to be equivalent to the claimed vertical scan period, then the period of time for vertical scan in both frames is identical since only the integration/shutter width changes between the two frame periods, rather than the read rate), and wherein an integration period of the plurality of rows of pixels is shifted with respect to each other (column 3, lines 28-62, the integration of each row is shifted in order to create a rolling shutter).

Therefore, it can be seen that Krymski fails to disclose the use of a sample hold circuit disposed in each one of said column lines and a horizontal scan circuit for generating horizontal scan signals to sequentially select an output of said sample hold circuit. Official Notice is taken that the concepts and advantages of having a sample hold circuit disposed in each one of said column lines as well as a horizontal scan circuit for generating horizontal scan signals to sequentially select an output of said sample hold circuit are notoriously well known in the art. Therefore, it would have been obvious to one of ordinary skill in the art to modify the Krymski device to include the use of a sample hold circuit disposed in each one of said column lines and a horizontal scan circuit for generating horizontal scan signals to sequentially select an output of said

sample hold circuit in order to reduce noise and properly synchronize all of the image data for storage.

3. In regard to **claim 2**, note Krymski discloses the use of an image sensor for capturing images, as claimed in claim 1 above. Therefore, it can be seen that Krymski fails to disclose that the horizontal scan circuit generates the horizontal scan signals while the vertical scan circuit selects each one of the row select lines, and the horizontal scan circuit does not generate said horizontal scan signals when said vertical circuit does not generate said vertical scan signals. Official Notice is taken that the concepts and advantages of only generating horizontal scan signals during a period of vertical scanning are notoriously well known and expected in the art. Therefore, it would have been obvious to one of ordinary skill in the art to modify the Krymski device to only generate horizontal scan signals during vertical scanning in order to allow for proper integration timing of the image prior to image transfer.

4. In regard to **claim 3**, note Krymski discloses that said pixel comprises a photoelectric conversion element , a reset transistor, a source follower transistor, and a selecting transistor which is controlled by said row select lines (column 3, lines 1-27 and figure 1: 102, 110, 104, and 106).

5. In regard to **claim 4**, note Krymski discloses that said first vertical scan period is a period which is a part of said first frame period (column 4, lines 1-34, the first frame period is considered to be the image captured using the integration/shutter width of 3 and the first vertical scan period is the time during which the image is read out within the frame period).

6. In regard to **claim 5**, note Krymski discloses an image sensor for capturing images, comprising a pixel array where pixels having photoelectric conversion elements are arranged in a matrix (column 2, lines 5-13 and figure 1: 100), a plurality of row select lines which are arranged in a row direction in said pixel array (column 3, lines 14-20 and figure 1: Row Sel), a plurality of column lines which are arranged in a column direction in said pixel array (column 3, lines 14-20 and figure 1: Col Bus), a vertical scan circuit for generating vertical scan signals to sequentially select said plurality of row select lines (column 4, lines 44-48), wherein said vertical scan circuit sequentially selects and scans said plurality of row select lines within a first vertical scan period when said image sensor is controlled to a first frame period and also sequentially selects and scans said plurality of row select lines within said first vertical scan period even when said image sensor is controlled to a second frame period, which is longer than said first frame period (column 3, lines 28-62, the integration of each row is shifted in order to create a rolling shutter), and wherein an integration period of the plurality of rows of pixels is shifted with respect to each other (column 3, lines 28-62, the integration of each row is shifted in order to create a rolling shutter).

Therefore, it can be seen that Krymski fails to disclose the use of a sample hold circuit disposed in each one of said column lines for sample holding photoelectric conversion signals of said pixels and a horizontal scan circuit for generating horizontal scan signals to sequentially select an output of said sample hold circuit while each one of said row select lines is selected. Official Notice is taken that the concepts and advantages of having a sample hold circuit disposed in each one of said column lines

as well as a horizontal scan circuit for generating horizontal scan signals to sequentially select an output of said sample hold circuit are notoriously well known in the art. Therefore, it would have been obvious to one of ordinary skill in the art to modify the Krymski device to include the use of a sample hold circuit disposed in each one of said column lines and a horizontal scan circuit for generating horizontal scan signals to sequentially select an output of said sample hold circuit in order to reduce noise and properly synchronize all of the image data for storage.

7. In regard to **claim 6**, note Krymski discloses that the transfer signal is not output after said first transfer period in said frame period has elapsed (column 4, lines 1-65; the image data is not read out when the read pointer is maintained in the same position before and after the vertical scan period).

8. In regard to **claim 7**, note Krymski discloses an image sensor for capturing images, comprising a pixel array where pixels having photoelectric conversion elements are arranged in a matrix (column 2, lines 5-13 and figure 1: 100), a plurality of row select lines which are arranged in a row direction in said pixel array (column 3, lines 14-20 and figure 1: Row Sel), a plurality of column lines which are arranged in a column direction in said pixel array (column 3, lines 14-20 and figure 1: Col Bus), a vertical scan circuit for generating vertical scan signals to sequentially select said plurality of row select lines (column 4, lines 44-48), wherein said vertical scan circuit sequentially selects and scans said plurality of row select lines within a vertical scan period which is part of the frame period, and does not select said row select lines outside said vertical scan period in said frame period (column 4, lines 1-65; the image data is not read out

when the read pointer is maintained in the same position before and after the vertical scan period), and wherein an integration period of the plurality of rows of pixels is shifted with respect to each other (column 3, lines 28-62, the integration of each row is shifted in order to create a rolling shutter).

Therefore, it can be seen that Krymski fails to disclose the use of a sample hold circuit disposed in each one of said column lines and a horizontal scan circuit for generating horizontal scan signals to sequentially select an output of said sample hold circuit. Official Notice is taken that the concepts and advantages of having a sample hold circuit disposed in each one of said column lines as well as a horizontal scan circuit for generating horizontal scan signals to sequentially select an output of said sample hold circuit are notoriously well known in the art. Therefore, it would have been obvious to one of ordinary skill in the art to modify the Krymski device to include the use of a sample hold circuit disposed in each one of said column lines and a horizontal scan circuit for generating horizontal scan signals to sequentially select an output of said sample hold circuit in order to reduce noise and properly synchronize all of the image data for storage.

9. In regard to **claim 8**, note Krymski discloses the use of an image sensor for capturing images, as claimed in claims 1, 5, and 7 above. Therefore, it can be seen that the primary device lacks the use of a line buffer for storing one row of output of said sample hold circuit, and an image processor for inputting an output of said line buffer, wherein in the horizontal scan period, an output signal of said sample hold circuit is stored in said line buffer responding to said horizontal scan signal, and said output

signal in said line buffer is output to said image processor responding to an output clock with a cycle longer than said horizontal scan signal.

Official Notice is taken that the concepts and advantages of using a line buffer for storing one row of output of said sample hold circuit, and an image processor for inputting an output of said line buffer, wherein in the horizontal scan period, an output signal of said sample hold circuit is stored in said line buffer responding to said horizontal scan signal, and said output signal in said line buffer is output to said image processor responding to an output clock with a cycle longer than said horizontal scan signal are notoriously well known and expected in the art. Therefore, it would have been obvious to one of ordinary skill in the art to modify the primary device of Krymski in view of Anderson to include the use of a line buffer for storing one row of output of said sample hold circuit, and an image processor for inputting an output of said line buffer, wherein in the horizontal scan period, an output signal of said sample hold circuit is stored in said line buffer responding to said horizontal scan signal, and said output signal in said line buffer is output to said image processor responding to an output clock with a cycle longer than said horizontal scan signal in order to output the image as it is captured in order to provide real time image processing and storage for live view generation or playback at a later time.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US006529242B1: note the use of a rolling shutter capturing images with different integration lengths.

US006566697B1: note the use of a rolling shutter.

US005471515A: note the use of a CMOS sensor.

US006501518B2: note the use of a rolling shutter.

US 20020089597A1: note the use of a rolling shutter.

US 20020175954A1: note the use of a rolling shutter.

US006271884B1: note the use of a rolling shutter.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chriss S. Yoder, III whose telephone number is (571) 272-7323. The examiner can normally be reached on M-F: 8 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivek Srivastava can be reached on (571) 272-7304. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CSY
June 5, 2007

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